

What is claimed is:

1. A heat sink for removing heat from a heat source, said heat sink comprising:

a core member comprising at least one first surface adapted to contact at least a portion of said heat source;

5 at least one outer peripheral surface located on said core member; and

at least one cooling fin device comprising at least one inner peripheral surface and at least one cooling fin associated therewith, said at least one inner peripheral surface of said cooling fin device being adjacent said at least one outer peripheral surface of said core member;

10 at least a portion of said at least one outer peripheral surface being tapered, wherein the circumference of said at least one outer peripheral surface in the proximity of said first surface being greater than the circumference of said at least one outer peripheral surface not in the proximity of said first surface.

2. The heat sink of claim 1, wherein the circumference of said at least one outer peripheral surface is greatest at a junction of said at least one outer peripheral surface and said at least one first surface.

3. The heat sink of claim 1, wherein said at least a portion of said at least one outer peripheral surface being tapered forms a continuous surface.

4. The heat sink of claim 1, wherein said at least one cooling fin provides at least one air channel, said at least one air channel being parallel said at least one outer peripheral surface of said core member, and said at least one air channel being adjacent said at least one cooling fin.

5. The heat sink of claim 4, and further comprising at least one second cooling fin, wherein said at least one second cooling fin bisects said at least one air channel.

6. The heat sink of claim 4, wherein said at least one air channel spirals said core member.

7. The heat sink of claim 1, wherein said at least one cooling fin device comprises at least one collar member having a plurality of cooling fins attached thereto and wherein said at least one collar member has at least one inner peripheral surface.

8. The heat sink of claim 1, wherein an interference fit exists between said at least one outer peripheral surface of said core member and said at least one inner peripheral surface of said at least one cooling fin device.

9. The heat sink of claim 1, and further comprising a shroud having at least one inner surface, wherein said at least one inner surface is located adjacent said at least one cooling fin.

10. The heat sink of claim 9, wherein said shroud has a first portion and a second portion, wherein said first portion is located adjacent said at least one cooling fin, and wherein said second portion extends beyond said core member.

11. The heat sink of claim 10, wherein said second portion has at least one slot formed therein.

12. The heat sink of claim 11, and further comprising a fan located opposite said at least one first surface; said fan having at least one circulating fin associated therewith; said at least one circulating fin being at

5 an angle relative to a centerline of said core; said at least one slot formed in said second portion of said shroud being at the same angle as said at least one circulating fin.

13. The heat sink of claim 1, wherein said core member comprises a heat pipe.

14. The heat sink of claim 1, wherein said core member further comprises a core member first portion oppositely disposed said at least one first surface, and wherein said heat sink further comprises an air blowing device located in the vicinity of said core member first portion.

15. The heat sink of claim 14, wherein said air blowing device is a fan.

16. The heat sink of claim 14, wherein said air blowing device has an air path associated therewith, wherein said at least one cooling fin has a substantially planar surface, and wherein said air path is substantially parallel to said at least one cooling fin surface.

5 17. The heat sink of claim 14, wherein said air blowing device comprises at least one blower fin, wherein said at least one blower fin has a blower fin surface, wherein said at least one cooling fin has a substantially planar surface, wherein an air path is substantially parallel to said at least one cooling fin surface, and wherein said air path is substantially perpendicular to said blower fin surface.

5 18. The heat sink of claim 1, wherein said core member further comprises a core member first portion oppositely disposed said at least one first surface, wherein said core member extends along an axis between said first surface and said first portion, wherein said cooling fin comprises at least one cooling fin surface, and wherein said at least one cooling fin surface is

substantially parallel to said axis.

19. The heat sink of claim 1, wherein said at least one cooling fin has a first end and a second end, wherein both said first end and said second end are portions of said at least one inner peripheral surface of said at least one cooling fin device.

20. The heat sink of claim 1, wherein each of said plurality of cooling fin devices comprise a first side and a second side and wherein said heat sink further comprises:

5 at least one collar, wherein each of said at least one collar has at least one inner peripheral surface having a perimeter associated therewith, and wherein said outer peripheral surface of said core member has a perimeter associated therewith that closely corresponds to said perimeter of said plurality of collars;

10 wherein said inner peripheral surfaces of said plurality of collars form interference fits with said outer peripheral surface of said core member; and

wherein said first side and said second side of at least one of said plurality of cooling fin devices abut a collar.

21. The heat sink of claim 1, wherein said at least a portion of said core member and said at least one cooling fin device are extruded from a single piece of material.

22. A method of manufacturing a heat sink, said method comprising:

5 providing a core member having at least one outer peripheral surface and a first surface, said first surface being adapted to be located adjacent a heat source, at least a portion of said at least one outer peripheral surface being tapered, wherein the circumference of said at least one outer peripheral surface in the proximity of said first surface is greater than the circumference of said at least one outer peripheral surface not in the

proximity of said first surface; and

10 pressing at least one cooling fin device onto said core member, said at least one cooling fin device comprising at least one cooling device inner peripheral surface and at least one cooling device cooling fin associated therewith.

23. The method of claim 22, wherein said pressing forms an interference fit with said at least one outer peripheral surface of said core member.

24. The method of claim 22, wherein said core member further comprises a core member first portion oppositely disposed said at least one first surface, and further comprising providing an air blowing device located in the vicinity of said core member first portion.

25. The method of claim 24, wherein said air blowing device has an air path associated therewith, wherein said at least one cooling fin has a substantially planar surface, and wherein said air path is substantially parallel to said at least one cooling fin surface.

26. The method of claim 24, wherein said air blowing device comprises at least one blower fin, wherein said at least one blower fin has a blower fin surface, wherein said at least one cooling fin has a substantially planar surface, wherein an air path is substantially parallel to said at least one cooling fin surface, and wherein said air path is substantially perpendicular to said blower fin surface.

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27. The method of claim 23, wherein said core member further comprises a core member first portion oppositely disposed said at least one first surface, wherein said core member extends along an axis between said first surface and said first portion, and wherein said at least one cooling fin surface is substantially parallel to said axis.

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28. The method of claim 23, and further comprising said at least one cooling fin device with a shroud.

29. The method of claim 23, and further comprising pressing at least one collar onto said core member; wherein said at least one collar forms an interference fit with said outer peripheral surface of said core member; and wherein said at least one collar abuts said at least one cooling fin device.

30. A method of cooling an object, said method comprising:  
locating a heat sink adjacent at least a portion of said object, said heat sink comprising:

a core member comprising at least one first surface adapted to be located adjacent said at least a portion of said object;

at least one outer peripheral surface located on said core member; and

at least one cooling fin device comprising at least one inner peripheral surface and at least one cooling fin associated therewith, said at least one inner peripheral surface of said cooling fin device being adjacent said at least one outer peripheral surface of said core member;

at least a portion of said at least one outer peripheral surface being tapered, wherein the circumference of said at least one outer peripheral surface in the proximity of said first surface being greater than the circumference of said at least one outer peripheral surface not in the proximity of said first surface;

forcing air past said at least one cooling fin device.

31. The method of claim 30, wherein said core member comprises a second surface located opposite said at least one first surface, said forcing

air comprises forcing air past said at least one cooling fin in a direction from said second surface toward said at least one first surface.

32. The method of claim 30, wherein said forcing air comprises locating an air blowing device proximate said at least one first surface and using said air blowing device to force air past said at least one cooling fin device.

33. The method of claim 32, wherein said air blowing device is a fan.

34. The method of claim 30, wherein said heat sink further comprises a shroud having at least one inner surface, wherein said at least one inner surface is located adjacent said at least one cooling fin device.